

IN THE UNITED STATES DISTRICT COURT  
FOR THE WESTERN DISTRICT OF PENNSYLVANIA

UNIVERSITY OF PITTSBURGH OF  
THE COMMONWEALTH SYSTEM  
OF HIGHER EDUCATION,

Plaintiff,

08cv01307

**ELECTRONICALLY  
FILED**

v.

VARIAN MEDICAL SYSTEMS, INC.,

Defendant.

**MEMORANDUM OPINION RE: SPECIAL MASTER'S REPORT AND  
RECOMMENDATION (DOC. NO. 283); PLAINTIFF'S MOTION TO ADOPT-IN-  
PART AND MODIFY-IN-PART THE SPECIAL MASTER'S REPORT AND  
RECOMMENDATION (DOC. NO. 284); AND DEFENDANT'S MOTION TO  
MODIFY IN PART THE SPECIAL MASTER'S REPORT AND  
RECOMMENDATION (DOC. NO. 285)**

**I. Introduction**

In this action, Plaintiff University of Pittsburgh ("Pitt") accuses Defendant Varian Medical Systems ("Varian") of infringing U.S. Patent No. 5,727,554 ("the '554 patent"). The Court appointed a Special Master, former United States District Court Judge Donald E. Ziegler, to oversee the claims construction process in this litigation on June 18, 2010. Doc. No. 182. Following briefing, a *Markman* hearing was held on December 17, 2010. On April 6, 2011, the Special Master issued a Report and Recommendation ("R & R") on disputed claim terms of the '554 patent. Doc. No. 283.

Pitt has moved the Court to modify the conclusion of the Special Master with regard to a disputed term in Claim 30, to clarify the construction of a word in Claim 20, and to adopt the rest of the R & R. Doc. No. 284. Varian moves the Court to adopt the R & R's construction of seven disputed terms and to modify or clarify the Special Master's recommended construction of all

other disputed terms. Doc. No. 285. Varian focuses its attention on three particular terms: it asks the Court to modify the recommended construction of the “means determining movement” and “camera means” terms of Claim 20, and it asks the Court to clarify the construction of the “digital image signals representing an image of said patient” term of Claim 20. *Id.* After extensive briefing from both parties and careful consideration of the applicable legal principles, the Court will rule as follows.

## **II. Legal Standard**

In patent infringement litigation, courts construe patents as a matter of law. *See Markman v. Westview Instruments, Inc.*, 517 U.S. 370, 377-90 (1996). “It is a ‘bedrock principle’ of patent law that ‘the claims of a patent define the invention to which the patentee is entitled the right to exclude.’” *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc) (quoting *Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1115 (Fed. Cir. 2005)).

The United States Court of Appeals for the Federal Circuit in *Phillips* provides United States District Courts with extensive instructions on how to conduct claim construction analysis:

A court construing a patent claim seeks to [afford] a claim the [ordinary and customary] meaning it would have to a person of ordinary skill in the art at the time of the invention . . . .

In some cases, the ordinary meaning of claim language as understood by a person of skill in the art may be readily apparent even to lay judges, and claim construction . . . involves little more than the application of the widely accepted meaning of commonly understood words . . . .

In many cases . . . determining the ordinary and customary meaning of the claim requires examination of terms that have a particular meaning in a field of art. Because the meaning . . . as understood by persons of skill in the art is often not immediately apparent, and because patentees frequently use terms idiosyncratically, the court looks to those sources available to the public that show what a person of skill in the art would have understood disputed claim language to

mean . . . . Those sources include the words of the claims themselves, the remainder of the specification, the prosecution history, and extrinsic evidence concerning relevant scientific principles, the meaning of technical terms, and the state of the art . . . .

Within the class of extrinsic evidence, the court has observed that dictionaries and treatises can be useful in claim construction.... We have especially noted the help . . . technical dictionaries may provide to a court to better understand the underlying technology and the way in which one of skill in the art might use the claim terms . . . . Because dictionaries, and especially technical dictionaries, endeavor to collect the accepted meanings of terms used in various fields of science and technology, those resources have been properly recognized as among the many tools that can assist the court in determining the meaning of particular terminology to those of skill in the art . . . . Such evidence, we have held, may be considered if the court deems it helpful in determining the true meaning of [the] language used . . . .

*Phillips*, 415 F.3d at 1303, 1313-14, 1318 (Fed. Cir. 2005) (citations and internal quotations omitted).

### **III. Discussion**

#### *A. Varian's Objections to the Report and Recommendation*

##### *a. Objection to the Recommended Construction of "Means Determining Movement" in Claim 20*

Varian objects to the Special Master's interpretation of "means determining movement" contending that the interpretation describes the algorithm too broadly and misapplies Federal Circuit law in the process. Specifically, Varian contends that the recommended construction "would not require the 'robust' software described by the patent, with the result that the claim would arguably cover systems that have no ability to track natural fiducials." Doc. No. 285, 6.<sup>1</sup>

It is not disputed that "means determining movement" is a means-plus-function term whose corresponding structure is an algorithm. A two-step claim construction process applies to

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<sup>1</sup> All citations to the Docket refer to the ECF page numbers, not the individual pages numbered by counsel before they were filed.

means-plus-function elements. First, the claimed function must be identified and then the corresponding structure described in the specification for performing the function must be identified. *See e.g., Med. Instrumentation and Diagnostics Corp. v. Elekta AB*, 344 F.3d 1205, 1210 (Fed. Cir. 2003); *Cardiac Pacemakers, Inc. v. St. Jude Med. Inc.*, 296 F.3d 1106, 1113 (Fed. Cir. 2002). Here, the Special Master identified the function as “determining movement of said patient from the digital image signals of the patient, including movement associated with breathing by said patient.” Doc. No. 283, 18-19. Varian agrees with this description with one exception which Varian notes is not relevant. Doc. No. 285, 9.

For the second step in the process, both parties agree that the corresponding structure is a computer algorithm. *See* Doc. No. 285, 9 and No. 295, 15. However, Varian objects to the Special Master’s definition of the computer algorithm as “a computer processor programmed as a patient motion detector” which utilizes the following two-step process: “(1) identifies at least one fiducial from the image signals; and (2) tracks the movement of the fiducial(s) and equivalents.” Doc. No. 283, 19-20. Instead, Varian proposes that it should be identified by a four-step process. Said suggested process is as follows:

1. Detecting one or more fiducials in a digital image of a patient’s body by searching the image at successive levels of resolution using one or more templates;
2. Fine tuning the template(s) by selecting the median point match for each family of fiducials detected in the initial image;
3. Tracking the fiducial(s) in subsequent digital images of the patient’s body by searching the images at successive levels of resolution using the fine-tuned template(s); and
4. Determining movement of the patient by estimating the fiducials’ direction and distance and comparing changes in their spatial pattern from one image to another.

Doc. No. 285, 10.

The '554 patent includes an illustration that shows computer 49 which implements a patient motion detector 47. '554 patent, col.4 II. 13-14. The patent states that “the patient motion detector 47 detects and identifies the fiducials 39 and then tracks their movement.” *Id.* at col.4 II. 21-23. Varian’s proposed definition of the algorithm includes steps, that although they may be “important” or “part of the invention” or “required” for other functions, do not correspond to the Claim 20 function and therefore, were properly excluded by the Special Master. *See* 35 U.S.C. § 112 ¶ 6; *Cardiac Pacemakers*, 296 F.3d at 1113; *Med. Instrumentation*, 344 F.3d at 1210. Furthermore, the Court finds that the Special Master did not improperly rely on “claim differentiation”. *See Wegner Mfg., Inc. v. Coating Mach. Sys., Inc.*, 239 F.3d 1225, 1234 (Fed. Cir. 2001) (“examination of other claims in a patent may provide guidance and context for interpreting a disputed means-plus-function, especially if they recite additional functions.”).<sup>2</sup> Finally, the Special Master properly relied on *Harris Corp. v. Ericsson, Inc.*, 417 F.3d 1241 (Fed. Cir. 2005) to reject Varian’s argument that the corresponding structure must include “all” structure identified in the specification.<sup>3</sup>

In sum, because the claimed function at issue in Claim 20 is “determining movement of said patient from said digital image signals, including movement associated with breathing by

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<sup>2</sup> Although Varian notes that the Court in *Wenger* examined claims to determine the scope of a claimed function, rather than structure, it is applicable because other claims recite the functionality and corresponding structure that Varian proposes be imported into “means determining movement.”

<sup>3</sup> A review of the cases cited by Varian for the proposition that the Special Master misapplied the rule that the corresponding structure must include “all” structure identified in the specification reveals no precedential opinion for this Court that stands for that premise. *See* Doc. No. 285, 13-16.

said patient, including movement associated with breathing by said patient” and because the Special Master’s proposed construction identifies that corresponding structure in the patent specification for performing the function, Varian’s objections will be denied.<sup>4</sup>

*b. Objection to the Recommended Construction of “Digital Image Signals Representative of an Image of Said Patient” in Claim 20*

Varian objects to the Special Master’s recommended construction of “digital image signals representative of an image of said patient” in Claim 20 and seeks a construction clarifying that “the system must be capable of determining patient movement from digital image signals that represent the patient’s body, which would allow for tracking natural fiducials . . . .” Doc. No. 285, 17. Varian objects to the Special Master’s construction that implies that the system is “merely capable of tracking other objects or features that may appear in the camera’s field of view, such as artificial fiducials.” *Id.* at 17-18.

Varian concedes that the recommended construction does not preclude its argument, but “to avoid ambiguity,” requests that its proposed construction be adopted, or in the alternative, that the dicta indicating disagreement with its position should be disavowed. *Id.* However, the Court finds that under the plain language of the ‘554 patent specification, the “image of said patient” in Claim 20 may include both natural and artificial fiducials and therefore, Varian’s objection is unnecessary and will be denied.

As noted by the Special Master, his construction is not “inconsistent with the inclusion of artificial or natural fiducials because it could include either.” Doc. No. 283, 15. *See* Doc. No. 283, 14 (“Obviously, the image of the patient described in Claim 20 could include an image of

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<sup>4</sup> The Court will also deny Varian’s objections to the “means determining movement of at least one fiducial” of Claim 21, the “means continuously tracking said fiducial” of Claim 28, and the “means determining movement of said plurality of fiducials” of Claim 31. *See* Doc. No. 285, 17.

the patient with natural or artificial fiducials, because one of the purposes of the patent-in-suit is to detect and track the movement of natural or artificial fiducials during treatment to determine movement of the patient.”) Varian suggests that the Special Master misstated the issue because Claim 20 “must” use natural fiducials, when it need only be “capable” of using them. Doc. No. 285, 23. Varian’s proposed construction, emphasizing natural fiducials on a patient’s body, is inconsistent with the ‘554 patent’s disclosure that the “preferred fiducial” is an artificial fiducial. *See* Doc. No. 283, 16-17. Because the patent’s preferred fiducial is an artificial one and because Claim 20 does not exclude determining movement from both natural and artificial fiducials, Varian’s objection will be denied. *See Dow Chem. Co. v. Sumitomo Chem. Co., Ltd.*, 257 F.3d 1364, 1378 (Fed. Cir. 2001).<sup>5</sup>

The Special Master’s construction correctly identified a system which is capable of determining both natural and artificial fiducials and properly rejected the added “natural fiducial” requirement proposed by Varian. To add Varian’s proposed additional limitations would be inconsistent with claim construction precepts and would add more ambiguity than clarity to the issue. Therefore, Varian’s objection will be denied.<sup>6</sup>

*c. Objection to the Recommendation That the “Camera Means” of Claim 20 is Not a Means-Plus-Function Term, and that the Claim is Not Indefinite for Failure to Disclose a Structure for Digitizing the Camera Image*

Varian objects to the Special Master’s conclusions that the “camera means” term is not a means-plus-function term and that the patent discloses sufficient detail regarding the structure of

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<sup>5</sup> A prosecution disclaimer also does not apply in this case because it has not been demonstrated by “clear and unmistakable” evidence. *See Purdue Pharma L.P. v. Endo Pharms Inc.*, 438 F.3d 1123, 1136 (Fed. Cir. 2006).

<sup>6</sup> Varian’s objection to the “means determining movement . . .” of Claim 20 will also be denied. *See* Doc. No. 285, 24.

the “digitizer” component of the camera means. Doc. No. 285, 24-29. In response, Pitt accepts that “camera means” should be construed as a means-plus-function element pursuant to 35 U.S.C. § 112 ¶ 6. Doc. No. 295, 18. Therefore, the Court must determine whether the Special Master was correct to reject Varian’s contention that a digitizer is a “mechanism of unspecified structure.” Doc. No. 285, 26.

Varian contends that because there is “no detail about the structure of the digitizing mechanism whatsoever,” the ‘554 patent fails to disclose sufficient detail about the digitizing mechanism to save the claim from a defense of indefiniteness. Doc. No. 285, 27. The Special Master concluded that the bare term “digitizer” was sufficiently detailed in its structure to describe its ability to generate digital image signals representative of an image of the patient for purposes of Claim 20. Doc. No. 283, 11. This Court agrees.

Indefiniteness must be established under a “clear and convincing” standard because a statutory presumption of validity applies to each patent. *Datamize, LLC v. Plumtree Software, Inc.*, 417 F.3d 1342, 1348 (Fed. Cir. 2005). Here, the ‘554 patent discloses a “digitizer 45” in the patent text and drawings. Doc. No. 283, 14. The Court agrees that there is nothing “unspecified” or “indefinite” about the term “digitizer” and that it is a “well known structure.” It is one in which “one skilled in the art would understand the specification itself to disclose a structure.” *Biomedino, LLC v. Waters Technologies*, 490 F.3d 946, 953 (Fed. Cir. 2007).<sup>7</sup> Therefore, the Court will adopt the Special Master’s finding that a digitizer is a well-known structure at the time of the invention and will deny Varian’s objections.

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<sup>7</sup> The present case is distinguishable from the holdings in *Biomedino*, 490 F.3d 946 and *Default Proof Credit Card v. Home Depot U.S.A., Inc.*, 412 F.3d 1291 (Fed. Cir. 2005) because the structures at issue in those cases were capable of a much broader meaning than “digitizer” which is a well-known structure.



*d. Varian's Other Objections*

Varian also “objects to the R&R’s other recommendations, except those set forth in Section III.F . . . .” Doc. No. 285, 24, 29. Varian’s relies on the arguments stated in its Claim Construction Brief. *See* Doc. No. 221. The Court is not persuaded by Varian’s objections and will adopt these parts of the R & R.

*B. Pitt's Objections to the Report and Recommendation*

*a. Objection to Special Master's Conclusion that Term “Quasi-Periodic Motion” as Used in Term 30 is Indefinite*

The Special Master determined that the term “quasi-periodic motion” is indefinite as used in the Claim 30 phrase “processing means further comprises software to predict quasi-periodic motion associated with at least one fiducial.” *See* Doc. No. 283, 26-27. Pitt asserts that the term is not indefinite, and the Court agrees.

Patent specifications must “conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.” 35 U.S.C. § 112. This definiteness requirement exists to ““ensure that the claims delineate the scope of the invention using language that adequately notifies the public of the patentee’s right to exclude.”” *Young v. Lumenis, Inc.*, 492 F.3d 1336, 1346 (Fed. Cir. 2007) (quoting *Datamize, LLC v. Plumtree Software, Inc.*, 417 F.3d 1342, 1347 (Fed.Cir.2005)). A claim is not indefinite if its terms can be given ““any reasonable meaning.”” *Young*, 492 F.3d at 1346 (quoting *Datamize*, 417 F.3d at 1347).

In finding the term “quasi-periodic motion” indefinite, the Special Master relied heavily on the decision in *Rackable Sys. v. Super Micro Computer, Inc.*, No. 05-3561, 2006 WL

3065577, (N.D. Cal. Oct. 27, 2006). In that case, the patent used the word “periodic” to describe the term “intermittent,” and the Court found both terms to be indefinite:

the patent's reference to “periodic” does not save the term [intermittent] from indefiniteness. That is because both terms – “periodic” and “intermittent” – suggest time frames, and a certain regularity that depends on a user's purpose. However ... because a user's purpose is highly subjective and variable, the terms “periodic” and “intermittent” do not provide the type of “objective anchor” required by 35 U.S.C. § 112.

*Id.* at \*8

While *Rackable* construes the word “periodic,” it does so with regard to a patent on a device quite different from the device in the instant case. In *Rackable*, the patented product was a computer equipment storage system, and the disputed term was “components requiring intermittent physical access.” *Id.* at \*7. The Court found the terms “intermittent” and “periodic” indefinite because the patent provided no objective indication of how often the components would be accessed; rather, access would be based on the user's subjective purposes. *See id.* at \*8.

In the present case, the “quasi-periodic motion” at issue occurs not because of an individual's subjective decision, but rather because of an objective occurrence – the individual's breathing. Varian argues that because software used must be written by a person, “who will have to make subjective determinations about how to distinguish quasi-periodic motion from other motion in deciding how to write the software,” it is indefinite. Doc. No. 294, 6. However, because the meaning of “quasi-periodic motion” can be determined by a person of ordinary skill in the art, the term is not indefinite.

The United States Court of Appeals for the Federal Circuit has recognized that terms of approximation can be used in patent specifications, and where appropriate, “terms of

approximation . . . need not be construed with mathematical precision.” *N. Am. Container, Inc. v. Plastipak Packaging, Inc.*, 415 F.3d 1335, 1346 (Fed. Cir. 2005) (citing *Anchor Wall Sys. v. Rockwood Retaining Walls, Inc.*, 340 F.3d 1298, 1311 (Fed. Cir. 2003)). Thus, in *Young*, a case involving a device for removing cats’ claws, the court found the term “near” to be sufficiently definite when describing a location on a cat’s paw because “the amount of skin required to be incised will vary from animal to animal based on the animal’s size.” *Young*, 492 F.3d at 1346.

Similarly, in the instant case, an approximate term such as “quasi-periodic” is needed because the frequency of breath varies from person to person. As such, Varian’s argument that the ‘554 specification fails because it does not provide any standard for distinguishing “quasi-periodic motion” from other motion is not persuasive because breathing will necessarily vary between individuals. Unlike the term “intermittent” in *Rackable*, the term “quasi-periodic” here is not completely subjective; rather, as in *Young*, it is the most objective term possible under the circumstances, and a term that would be understood by an individual of ordinary skill. *See Am. Video Graphics, L.P. v. Microsoft Corp.*, No 05-06, 2005 WL 6218780, at \*6 (E.D. Tex. June 30, 2005) (construing term “periodically” as meaning “from time to time”).

Because the term “quasi-periodic” can be given a “reasonable meaning,” and because a standard for measuring whether motion is “quasi-periodic” is found in the ‘554 specification, the Court finds that it is not indefinite. *See Young*, 492 F.3d at 1346; ‘554 patent, col. 8, lines 12-16. The Court construes the term “quasi-periodic” to mean “motion that reoccurs at approximately regular intervals, such as motion due to patient breathing” and will modify the Report and Recommendation accordingly.

*b. Request for Clarification that the Second Instance of “Generating” in Claim 20 Does Not Require Construction*

The Special Master construed “generating” in the context of the phrase “camera means generating” in Claim 20 to mean “digitizing an image of the patient to create [digital image signals representative of the image of the patient].” Doc. No. 283, 13. Pitt contends that Claim 20 includes a second instance of “generating” in the phrase “gating means generating gating signals. . .” for which the Special Master’s construction is not suitable. Pitt also argues that the second instance of “generating” is similar to that in Claim 22, which the Special Master found to be understandable by a jury without further construction. Doc. No. 284, 8-9. Therefore, Pitt moves this Court to clarify that no construction is required for the second instance of “generating” in Claim 20 and to adopt the Special Master’s rejection of Varian’s construction. *Id.* at 9.

In response, Varian argues that “generating” in the second instance of the term in Claim 20 should be construed to mean “actively generating.” Doc. No. 294, 10. Varian emphasizes that the usual way to phrase a means-plus-function element would have been to say “means for generating . . .”, but Pitt’s grammar choice of “means generating . . .” must be given effect. *Id.* at 9, signaling *In re Hyatt*, 708 F.3d 712, 714 (Fed. Cir. 1983).<sup>8</sup>

The second use of the term “generating” in Claim 20 is similar to its use in Claim 22, which the Special Master found to be clear and did not require construction. *See* Doc. No. 283, 14. As in Claim 22, “the jury will understand the term in context of the claim.” *Id.* It would be

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<sup>8</sup> The Court need not address Section B of Varian’s Response to Pitt’s Motion to Adopt-in-Part and Modify-in-Part the Special Master’s Report and Recommendation (Doc. No. 294) because Pitt, in its Response to Varian’s Objections to the Report and Recommendation and Motion to Modify in Part and Adopt in Part, concedes that it is “prepared to accept Varian’s contention that “camera means” is a means-plus-function term.” Doc. No. 295, 18-22.

clear to a jury that the term “generating” implies an active action. Therefore, because of its clear meaning on its face, the second use of “generating” in Claim 20 does not require any further construction. Accordingly, no modification to the Report and Recommendation is necessary in this respect.

#### **IV. Conclusion**

For the foregoing reasons, the Special Master’s Report and Recommendation (Doc. No. 283) will be adopted-in-part and modified-in-part.

An appropriate Order follows.

s/Arthur J. Schwab  
Arthur J. Schwab  
United States District Judge

cc: All Registered ECF Counsel and Parties